

Appl. No. 10/810,479
Amtd. Dated March 16, 2005
Reply to Office action of December 22, 2004

AMENDMENTS TO THE SPECIFICATION

Please delete paragraph [022].

Please add paragraph [022a].

[022A] Figures 5A and 5B show alternative embodiments of hollow fasteners for use as according to the present invention.

Please replace paragraph [021] with the following amended paragraph.

[021] Figure 3 and Figure 4 show[[s an]] end views of [[a]] embodiments of constant velocity joints according to the present invention.

Please replace paragaph [024] with the following amended paragraph.

[024] Figure 1 shows a typical drive line 12 in an automotive vehicle. The drive line 12 of Figure 1 represents a typical all-wheel drive vehicle, however it should be noted that the constant velocity joints 10 of the current invention can also be used in rear-wheel drive vehicles, front-wheel drive vehicles, all-wheel drive vehicles and four-wheel drive vehicles. The drive line 12 includes an engine 14 that is connected to a transmission 16 and a power take off unit 18. A front differential 20 has a right hand side half shaft 22 and a left hand side half shaft 24, each of which are connected to a wheel 25 and deliver power to those wheels. On both ends of the right hand front half shaft 22 and left hand front half shaft 24 are constant velocity joints 10. The propeller shaft 27 connects the front differential [[22]] 20 to the power take off unit 18. The propeller shaft 26 connects the power take off unit 18 to the rear differential 28, wherein the rear differential 28 includes rear right hand side shaft 30 and a rear left hand side shaft 32, each of which ends with a wheel 25 on one end thereof. A constant velocity joint is located on both ends of the half shaft that connects the wheel 25 and the rear differential 28. The prop shaft 26, as shown in Figure 1, is a two-piece propeller shaft that includes a carden joint 34 and two high speed constant velocity joints 10. The constant velocity joints 10 transmit power to the wheels 25 through the drive shaft 26 even if the wheels 25 or the shaft have changing angles due to steering, suspension, bounce, and rebound. The constant velocity joints 10 may be of any of the

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standard types known, such as plunging tripod, cross groove joint, fixed ball joint, fixed tripod joint, double offset joints, etc., all of which are commonly known terms in the art for different varieties of constant velocity joints. The constant velocity joints 10 allow for transmission of constant velocities at angles which are found in everyday driving of automotive vehicles and both the half shafts and prop shafts of these vehicles.

Please replace paragraph [025] with the following amended paragraph.

[025] Figure 2 shows an embodiment of the current invention. The constant velocity joint 10 is a plunging ball constant velocity joint which is generally used in a prop shaft or half shaft of an all-wheel drive vehicle. It should be noted that any other type of CV joint, such as but not limited to a fixed constant velocity joint, may also be used for the present invention. The constant velocity joint 10 includes an outer race 36 which has a flange 38 in contact with one end thereof proximate to a flange 38. An inner wall of the outer race generally defines a constant velocity joint chamber 40. An inner race 42 is located and arranged within the outer race 36. The inner race 42 is connected to a stub shaft, drive shaft or prop shaft 26 of the vehicle. A plurality of balls or rolling elements 44 are located between an outer surface of the inner race 42 and the inner surface of the outer race 36. The balls 44 are held in position between the outer race 36 and the inner race 42 surfaces by a cage 46. Each race ball 44 is located within an indentation or track of the outer race inner surface. The rotation of the outer race 36 will rotate the inner race 42 at the same or constant speed thus allowing for constant velocity to flow through the joint 10 between the prop shaft 26 and the power take off unit or differential, that is at an angle up to a predetermined angle. The constant velocity joint 10 will allow the angle to change because the balls 44 will rotate and compensate for any differences in the angle between the shafts by moving within the outer race and inner race tracks. A ring retainer 48 or any other known fastener is arranged between the shaft 26 and the inner race 42 to connect the prop shaft or stub shaft 26 to the inner race 42. Any other type of connection is also possible between the prop shaft and the inner race.

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Please replace paragraph [030] with the following amended paragraph.

[030] It should be noted that the above embodiment has been illustrated with a six bolt arrangement as shown in Figures 2 and 3. However, it should be noted that it is contemplated that the idea may be used on any design from two to sixteen fastener configurations. In the embodiment shown the sleeve like member 62 is a hollow dowel for use as a torque transmitting component. However, it should be noted that it is contemplated to use a spring pin, roll pin, peg, or any other known hollow fastener or component for use with the present invention. (See Figures 5A and 5B.) In the embodiment shown the fasteners 66 are a bolt 66 which are commonly used to connect a constant velocity joint to a flange within a drive train environment. However, it should be noted that any type of fastener or correction method may also be used. With the bolts 66 being arranged through the hollow dowels 62 this will allow for the bolts 66 to attach the constant velocity joint 10 to the flange 38 and not be required to transmit torque through the assembly during rotation of the constant velocity joint 10 in its drive train application. The hollow dowels 62 will allow for torque transmission as required by the constant velocity joints specific applications thus separating the torque transmission from the attachment function of the constant velocity joint and flange assembly. It should be noted that all of the parts described above are made of steel however any other hard ceramic, metal, plastic, fabric, or the like may also be used. It should also be noted that any combination of hollow dowels 62 and attaching bolts 66 may be used for example only three of the orifices may have dowels 62 while all six of the orifices include an attaching bolt 66 therein. Therefore any combination of hollow dowels 62 to be used for transmitting the torque can be used with any combination of attaching bolts 66.